

# Design Process

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CS 376



# Wednesday: Project Faire

**Design and creation are  
not static processes.**

**They can be studied,  
supported and improved.**

# Design

Brainstorming process  
Early-stage design tools

# Evaluate

Study strategies  
Cognitive modeling

# Implement

Programming tools  
WYSIWYG design tools  
Rapid prototyping tools

Recall: process improvements to design

# Wizard-of-Oz Prototypes

- An iterative design methodology for user-friendly natural language office information applications [Kelley, TOIS '84]
- *“Central to the methodology is an experimental simulation which I call the OZ paradigm, in which experimental participants are given the impression that they are interacting with a program that understands English as well as another human would.”*

Recall: Wizard of Oz prototyping as an example

# Design as research

# Design-oriented HCI

[Fallman, CHI '03]

- HCI is distinct from natural or social sciences: its methodology is based in design
- Design is a context-dependent dialogue with the problem
- Perspectives on design
  - Conservative: as a scientific or engineering endeavor
  - Romantic: “imaginative masterminds equipped with almost magical abilities of creation”
  - Pragmatic: design is a reaction to a context

# Research through design

[Zimmerman, Forlizzi, and Evenson, CHI '07]

- How can designers make contributions to HCI research?
- Interaction designers wrestle with wicked problems

[Rittel and Webber, Policy Sciences '73]

- Wicked problems: problems whose requirements are contradictory or unknown — no global optimum
- To solve wicked problems: integrate known facts, engineering opportunities, and user research to create a new perspective



# Dispelling design as a 'black art'

[Wolf et al., CHI '06]

- Codifying design is like codifying the process of proving geometry theorems: a black art
- However, design does have a strong praxis
  - Non-linear process of intent and discovery
  - Design judgment
  - Making of artifacts
  - Design critiques ('crit')
- Argument: this process is structured, not mysterious

# The Power of Representation

[Norman, '94; Simon, '81]

- “The powers of cognition come from abstraction and representation: the ability to represent perceptions, experiences, and thoughts in some medium other than that in which they have occurred, abstracted away from irrelevant details.”
- Number scrabble from CSI47
  - Take turns picking numbers in 1,2,3,4,5,6,7,8,9 without replacement. Win if three of your numbers add up to 15.
  - ...or tic-tac-toe

# Design process



# What do prototypes prototype?

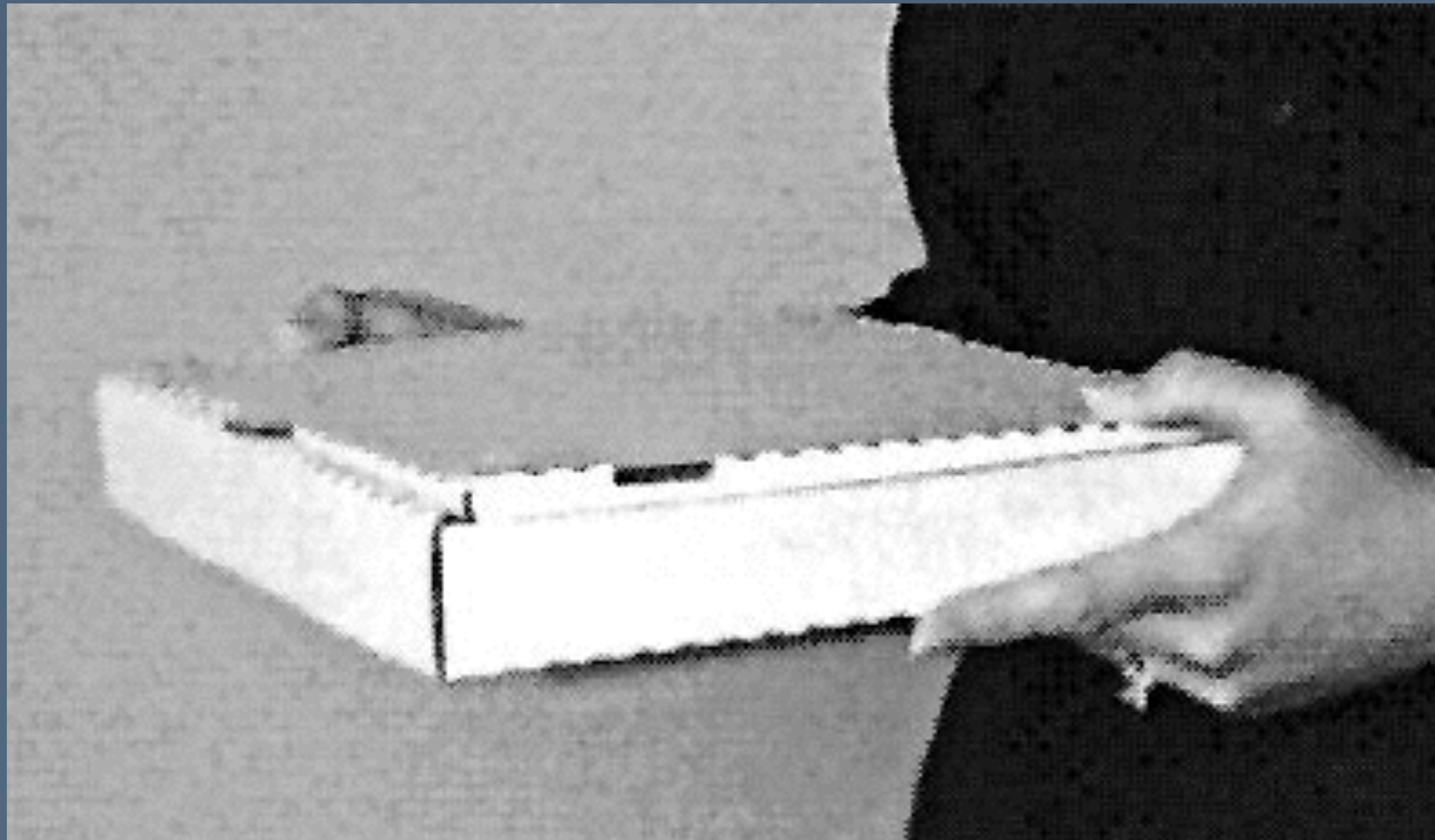
[Houde and Hill, Handbook of HCI '97]

- Role prototypes
  - Does the design support activities and tasks?
- Look and feel prototypes
  - What is the style and the form of the design?
- Implementation prototypes
  - How will the design be built or deployed?

# Role, look+feel, or implementation?

[Houde and Hill, Handbook of HCI '97]

- Apple's prototype of an architect's computer.
- Weighed the pizza box down appropriately, then watched architects carry it around a site.



# Iterate on a design, or create parallel alternatives?

[Dow et al., TOCHI '10]

- Feedback on five iterations or five parallel alternatives
- Quality measured via ad clickthrough
- Designs generated in parallel condition had ~1/3 more clicks

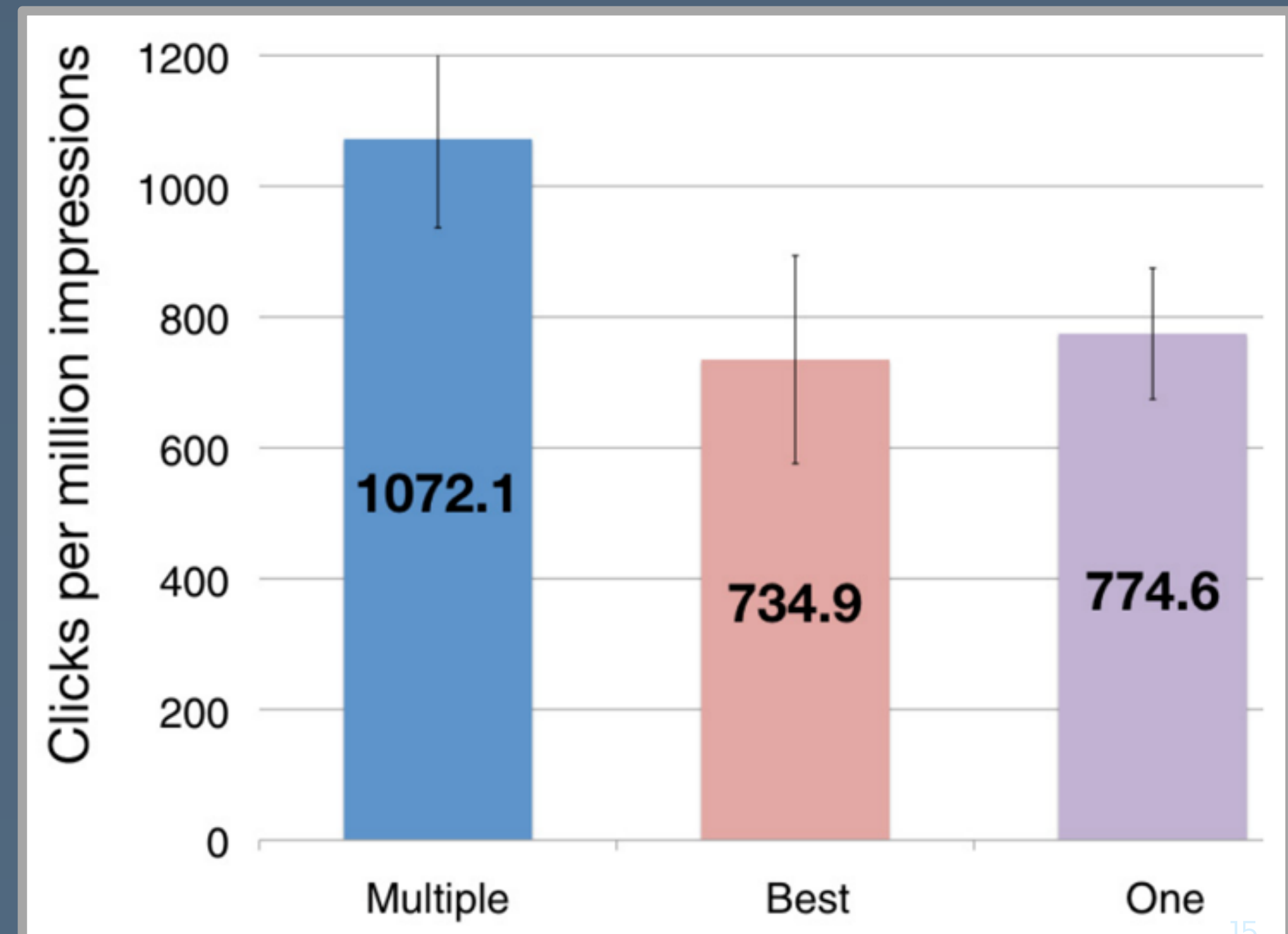




# Prototyping dynamics: share one, or share multiple?

[Dow et al., CHI '11]

- When getting feedback from a partner, designers would...
  - Share multiple: design and show three ads
  - Share best: design three and show one ad
  - Share one: design and show one ad



# Ethnographic approach to design

[Blomberg and Burrell, HCI Handbook '03]

- Qualitative research methods have matured into a core part of the HCI research toolkit
- A caution from Blomberg and Burrell:
  - “Insights from ethnographic studies do not map directly onto design specifications.”
- Instead, ethnographies provide deep insight into the user population and practice

# Implications for design?

[Dourish, CHI '06]

- If viewed as part of a design process, ethnography must produce actionable requirements for design and development
- “Scenic fieldwork” in HCI ignores the analytic contribution of an ethnographer
  - It is (wrongly) viewed as a method rather than a perspective



# Implications for design?

[Dourish, CHI '06]

- “Ethnography provides insight into the organization of social settings, but its goal is not simply to save the reader a trip; rather, it provides models for thinking about those settings and the work that goes on there.”
- “The value of ethnography, then, is in the models it provides and the ways of thinking that it supports.”

# Crowds in the classroom

[Dow, Gerber and Wong, CHI '13]

- Reach beyond the class population for design project classes
  - Needfinding: read and mine social media
  - Ideation: brainstorming with Mechanical Turk
  - Testing: MindSwarms video feedback on ideas
  - Pitching: Kickstarter & IndieGoGo



# Scaling the design studio

[Kulkarni et al., TOCHI '14]

- How can we teach design to millions?
- Klemmer's HCI class on Coursera: thousands of submissions, thousands of students
- Peer assessment: training students to give calibrated feedback on each others' design assignments
- Now deployed to many other classes, including network science, science fiction, english...



# Design resources

# Design patterns

[van Duyne, Landay and Hong, '06]

- Web design, much like web software, can be characterized by successful design patterns
- Examples...
  - News mosaics
  - Distinctive HTML titles
  - Quick-flow checkout
  - Floating windows

